

ENHANCING FLUID FLOW IN A STACKED PLATE MICROREACTOR

Abstract of the Disclosure

5 A stacked plate chemical reactor in which simple plates are stacked together to form the reactor. When openings in adjacent plates are properly aligned, fluid pathways and processing volumes are defined for chemical reactants, heat transfer medium, and a product. In one embodiment of the invention, an n -fold internal array is achieved by providing a first group of simple plates defining a reaction unit that includes bypass fluid channels and reaction fluid channels for each reactant, such that a portion of each reactant is directed to subsequent groups of simple plates defining additional reaction units. A chemical reactor with variable output is obtained in a preferred embodiment by reversibly joining reactor stacks comprising irreversibly joined reaction units, these reaction units consisting of a plurality of simple plates. Other embodiments employ at least one of an array of parallel fluid channels having different widths, bifurcated fluid distribution channels to achieve a substantially even flow equipartition for fluids with varying viscosities flowing within the fluid channels of each reaction unit.